



RESEARCH PAPER

Comparative study of microbial inoculants of cultivated and virgin soils of Nilgiri Biosphere for plant growth promotion

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Abstract : In virgin soils, microorganisms and plants live in harmony and both are dependent on each other for their livelihood. Absence of cultivation practices, undisturbed soil condition, high organic matter condition and other favourable conditions enables to flourish beneficial microbes. The research work was started to identify beneficial microbes from undisturbed virgin soils of Nilgiri biosphere with the ability to grow under low pH and under low temperature conditions. Bio-inoculants viz., *Azospirillum*, Phosphobacteria, *Azotobacter*, *Rhizobium* and pseudomonas were obtained from cultivated and virgin soil samples of Nilgiris biosphere. When compared with type cultures, virgin soil isolates of respective inoculants have recorded better results in promoting plant dry weight in paper towel method. In cross streak assay, selected isolates found to be compatible with each other. In lignite carrier base formulation, the inoculants have reached a maximum population level of 10^7 and phosphobacteria reached 10^8 level. The population remained steady at this level up to 3 months. In the field trial studies conducted, the treatment of *Azospirillum* + *Azotobacter* + Phosphobacteria + *Pseudomonas* + 75% RDF has recorded maximum population of all the inoculants at 45th day after sowing. However, the maximum yield was observed in 100% RDF and bio-inoculant consortium applied treatment. This was closely followed by 75% RDF and bio-inoculant consortium applied plots. The results of the field trial have shown that bio-inoculant consortium along with 75% RDF application will lead to maximum yield with 25% saving in chemical fertilizer application.

Key Words : Bio-inoculants, Virgin soil, *Azospirillum*, *Azotobacter*, Phosphobacteria, *Pseudomonas*, Plant growth promotion

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